

New mechanics for the **Coherent X-ray scattering endstation** at **BESSY**

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Stefan Eisebitt

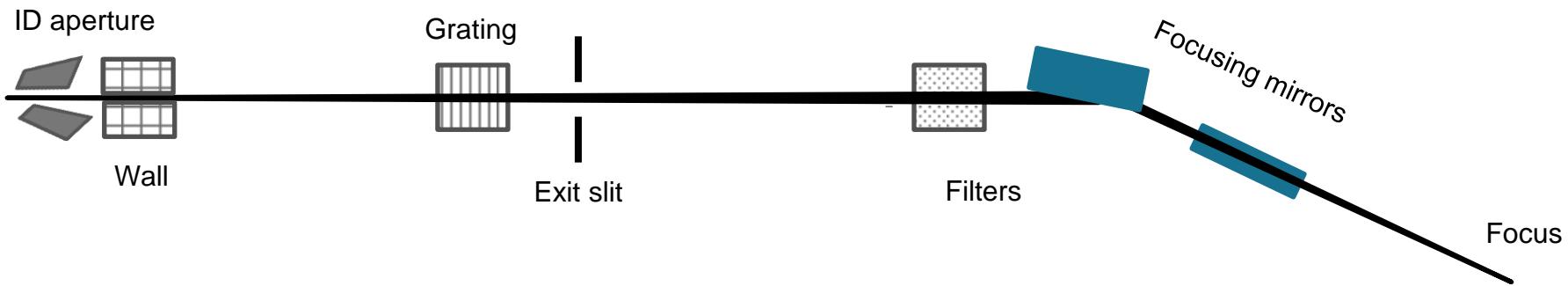
Institut für Optik und atomare Physik der TU-Berlin /
Helmholtz-Zentrum-Berlin für Materialien und Energie

Functionalities of the new endstation

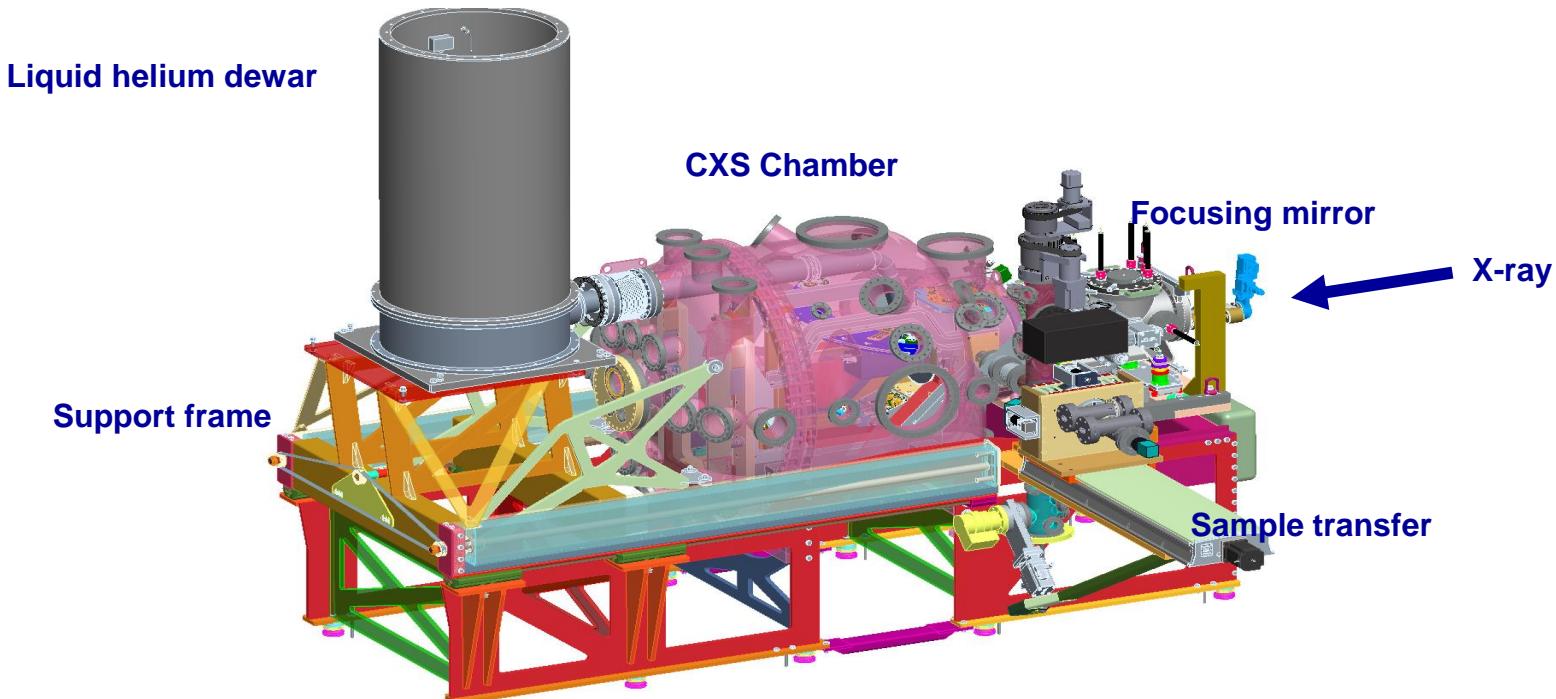
- Dedicated coherent scattering chamber for users
- High flux beam line at UE 49 SGM
- Reflection, Transmission
- Microscopy, Scattering (static and dynamic (time, temperature, field etc))
- Holography, Ptychography, Coherent Diffraction Imaging, Tomo-holography...
- Retractable for using other endstations like solid state RICXS

Beamline

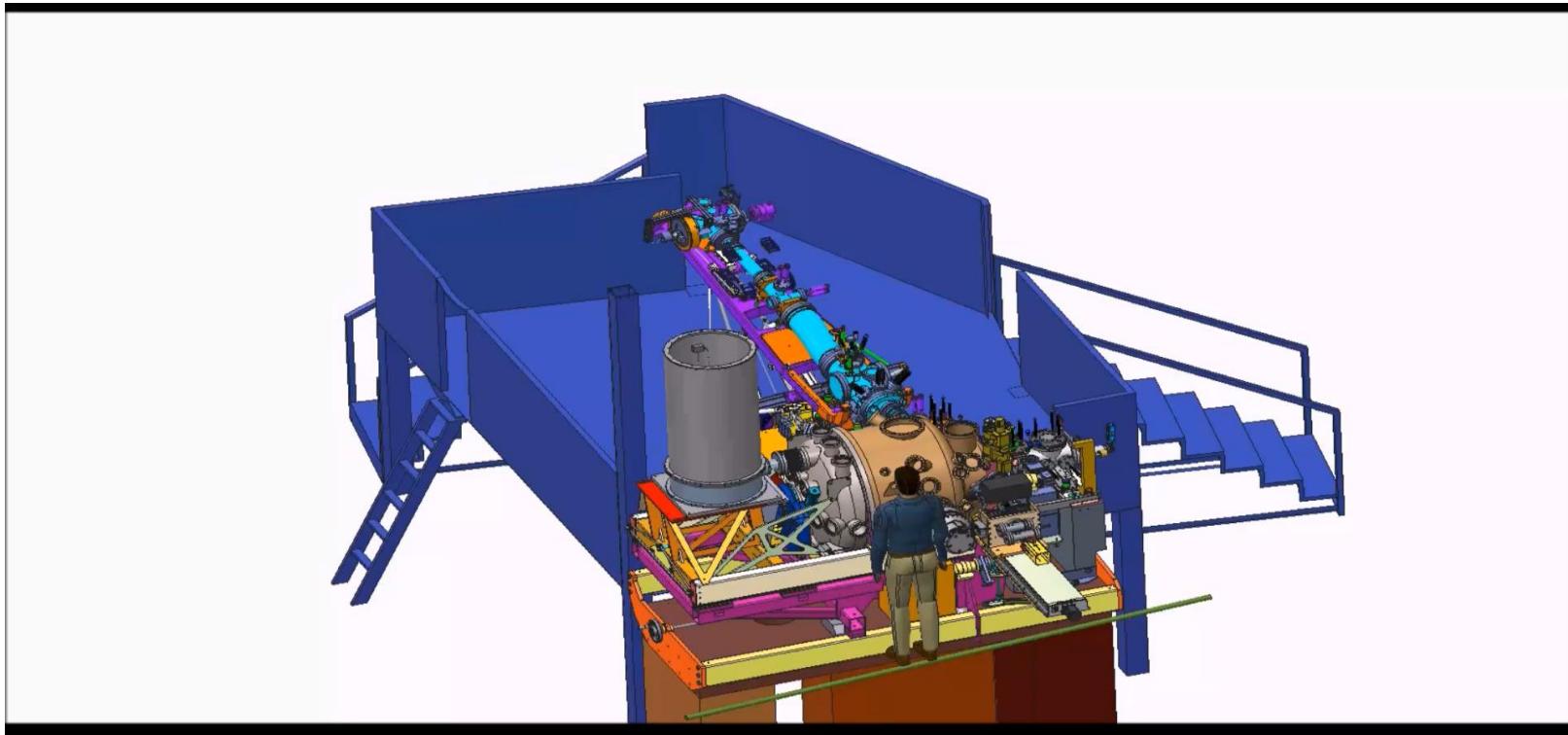
Schematic view of the beam line (not up to scale)



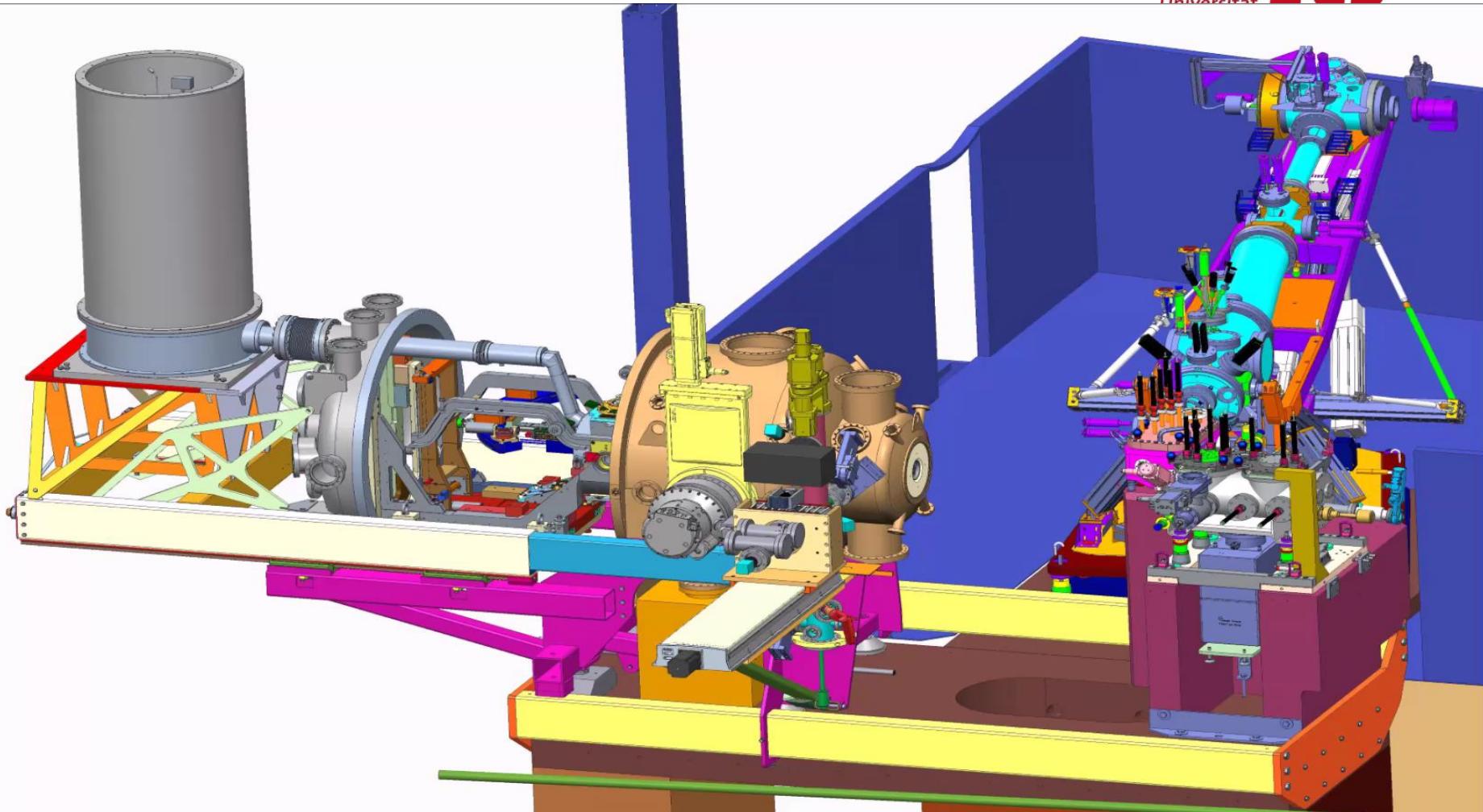
Design



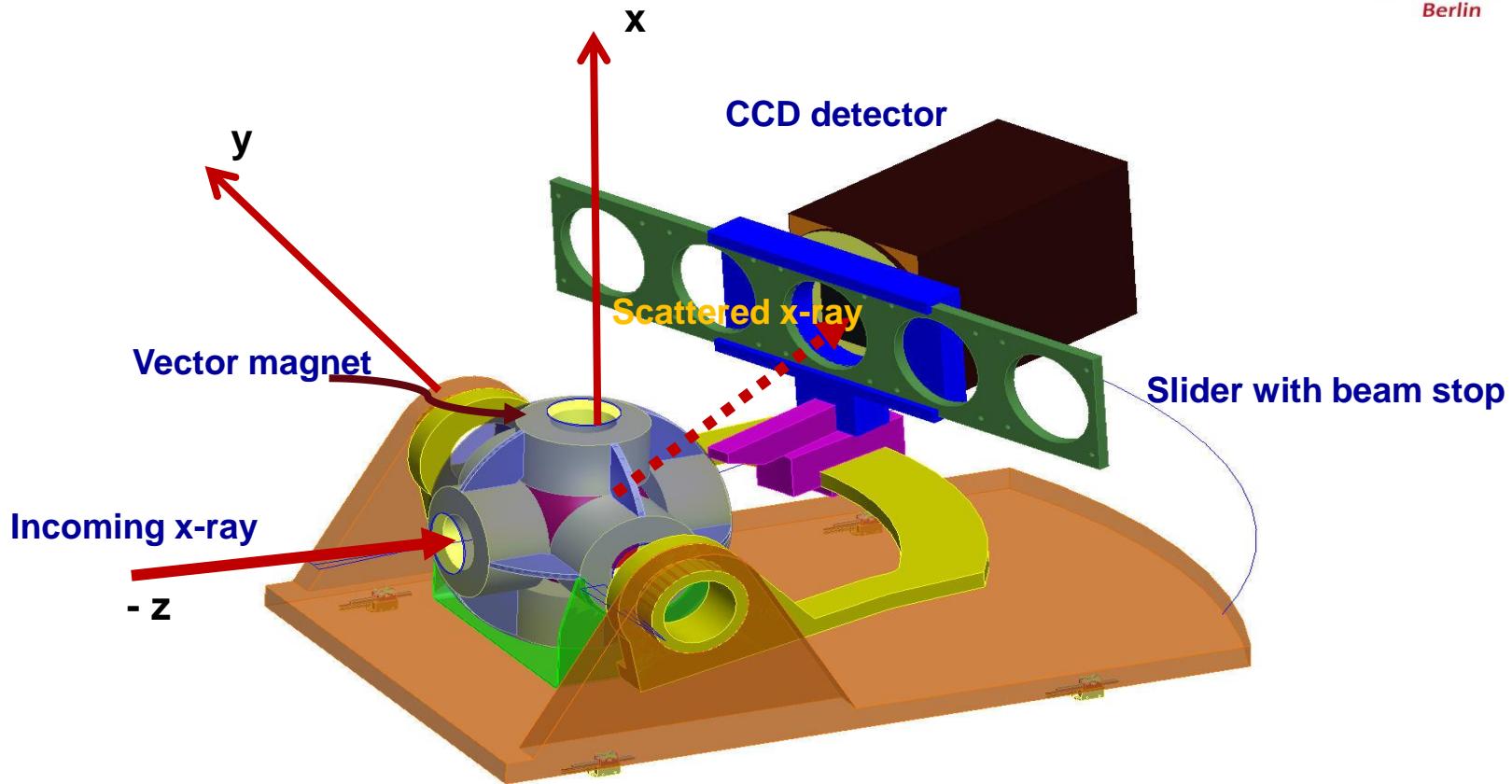
The experiment platform at 1.6 m

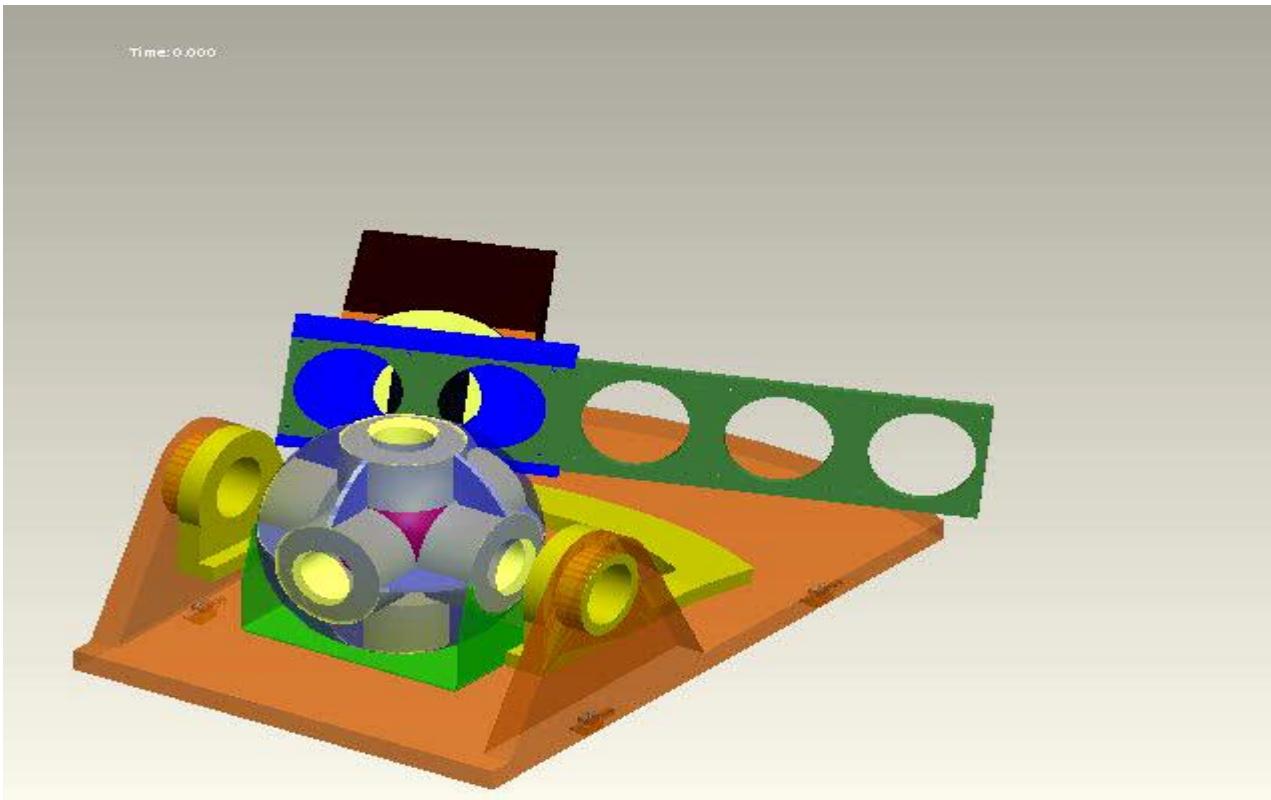


Opening and retracting the chamber

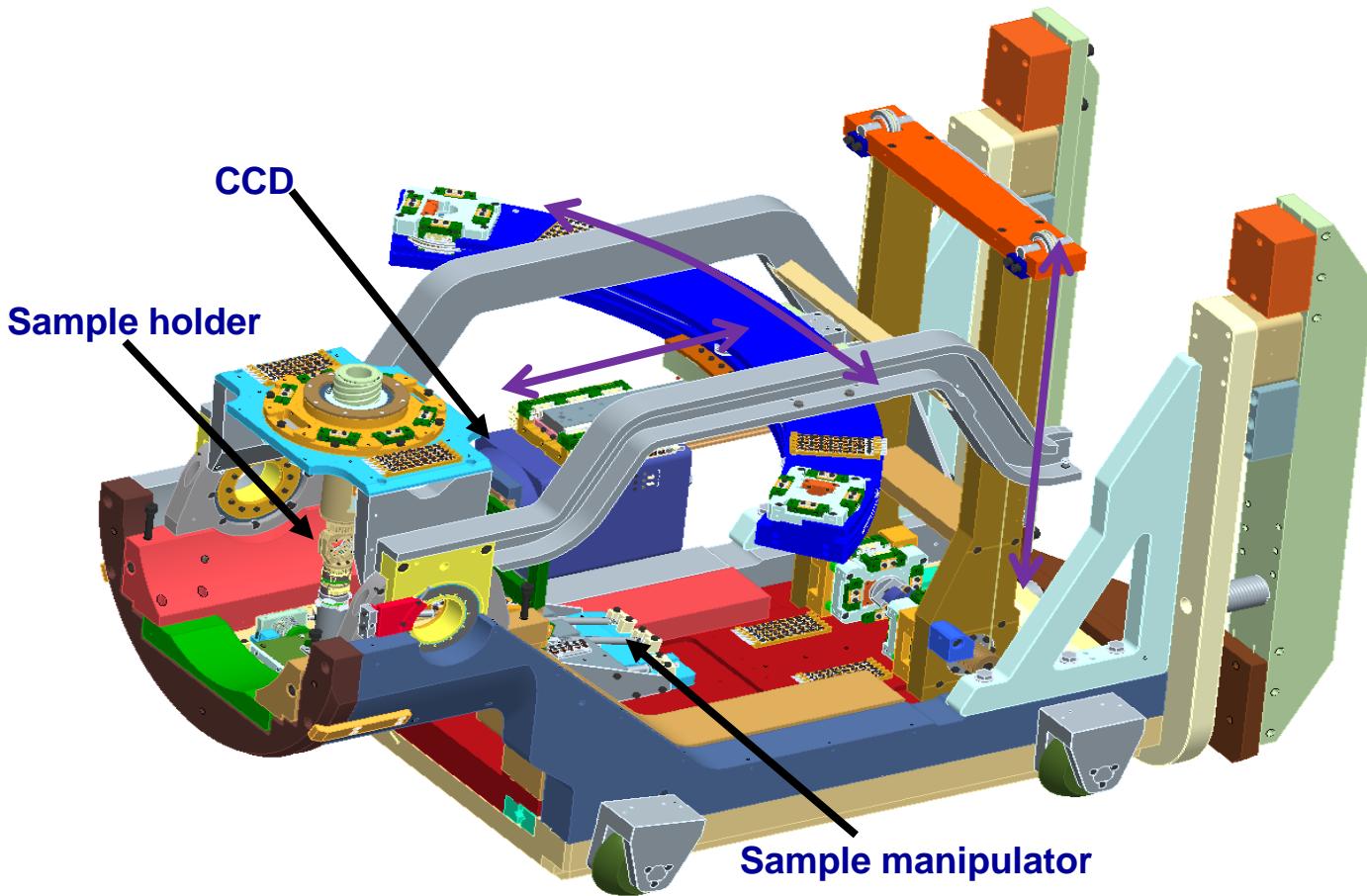


Scattering geometry

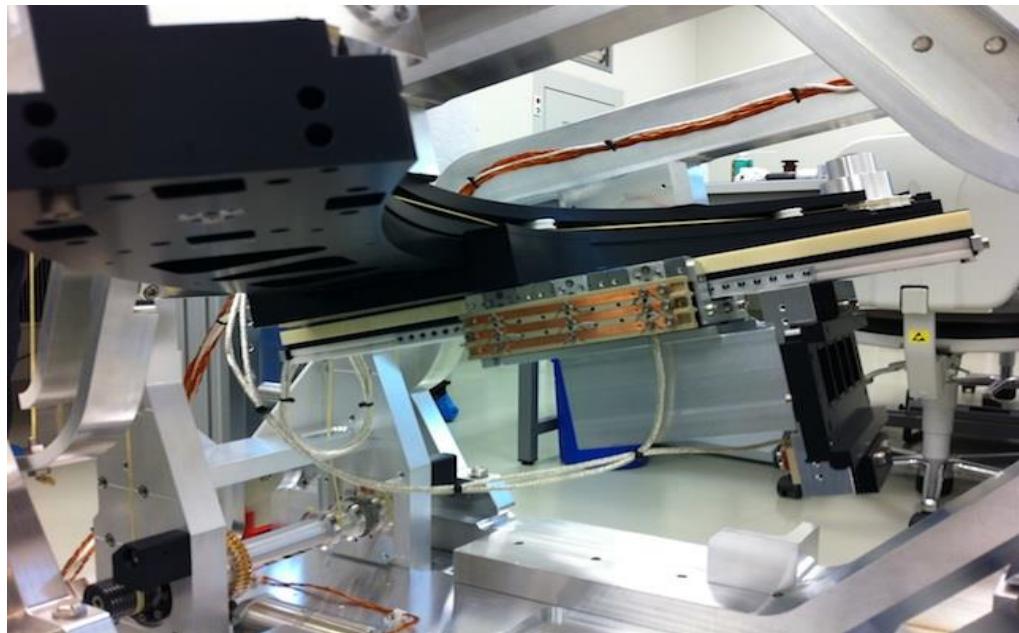
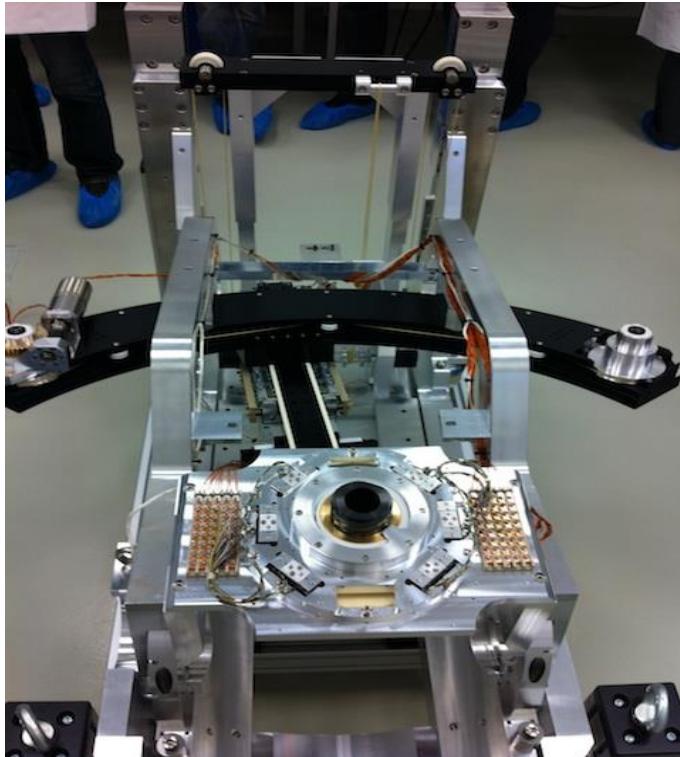




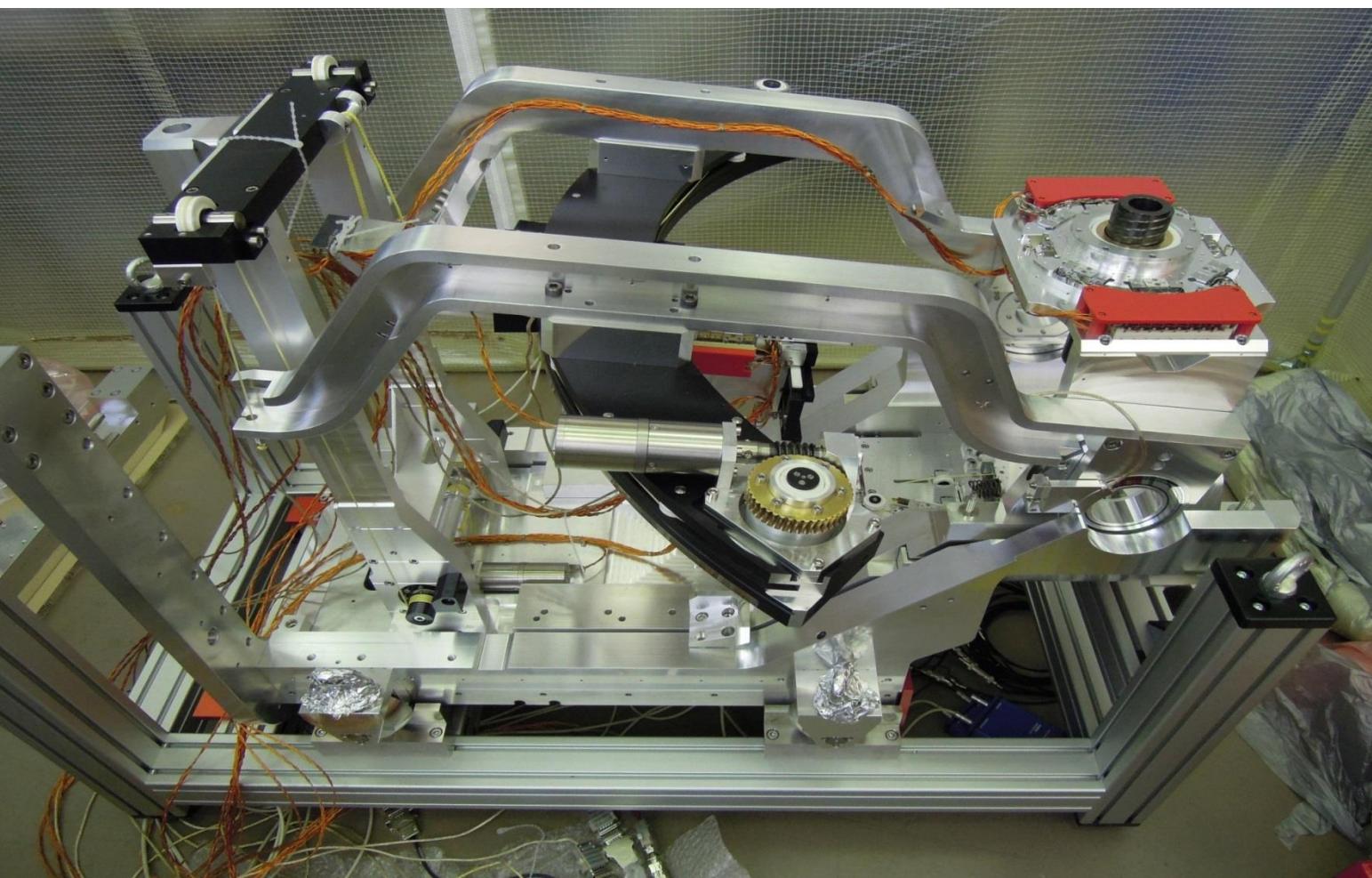
Inner mechanics without magnet



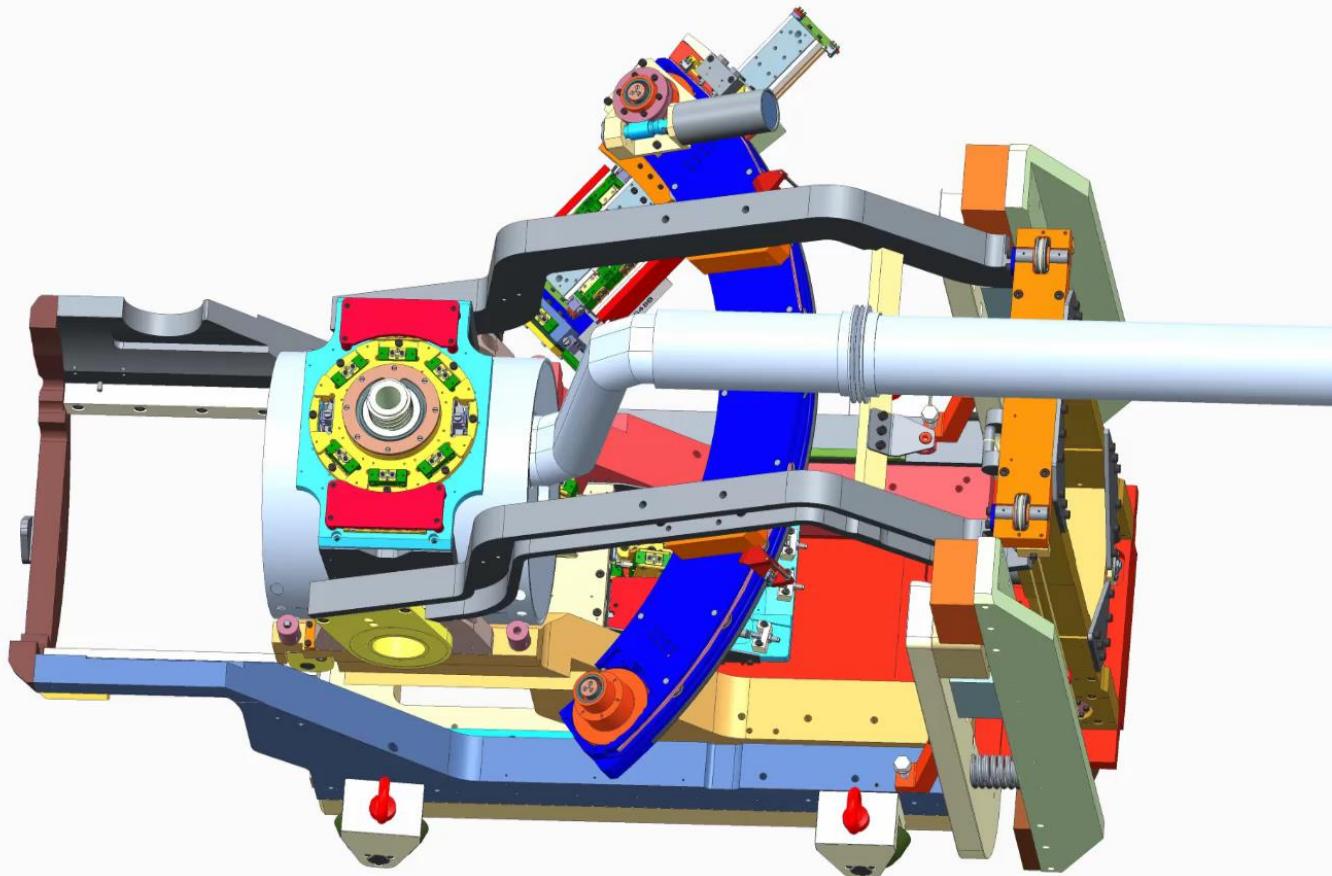
Inner part without magnet



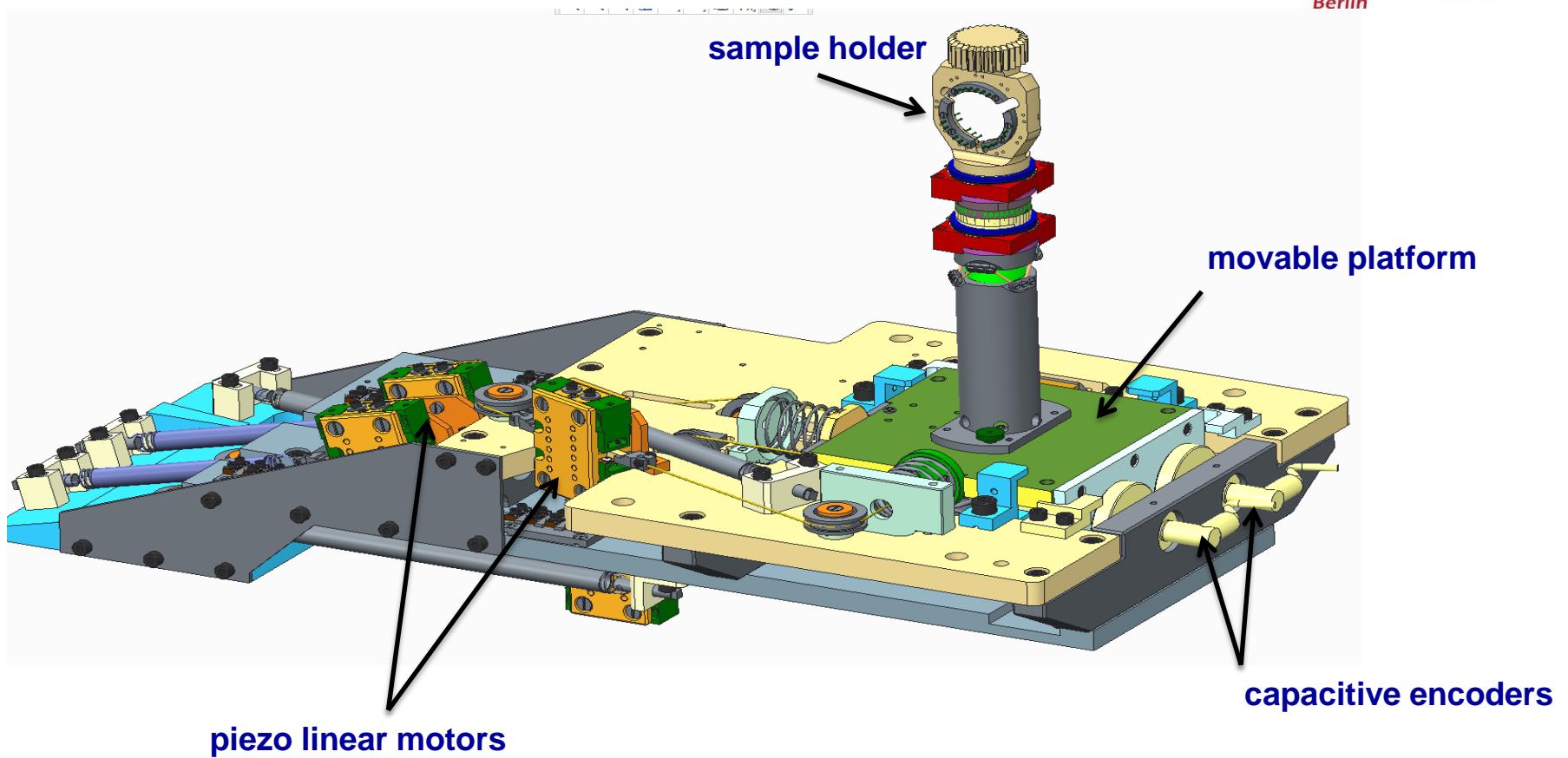
The detector manipulator inside the transport frame



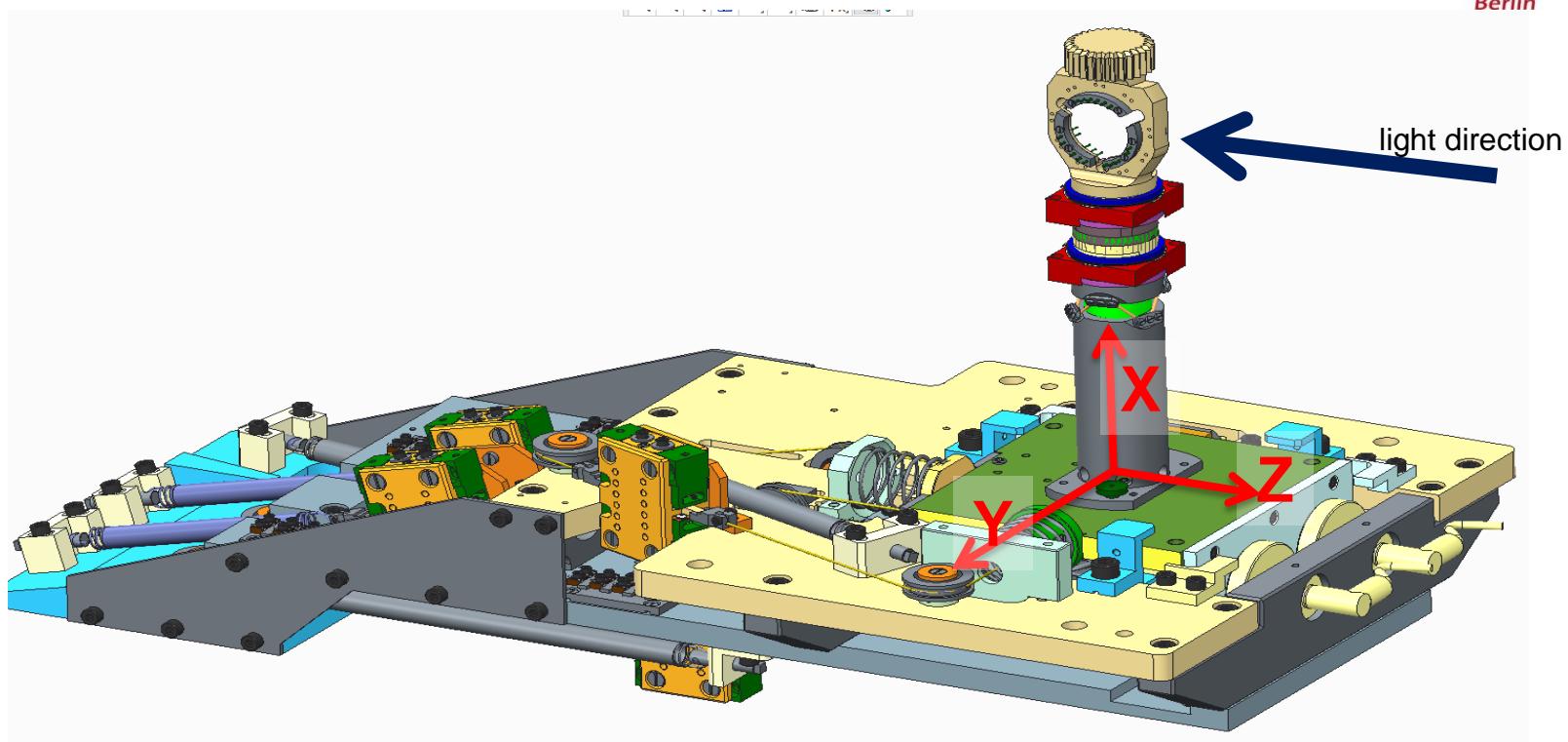
CCD movements



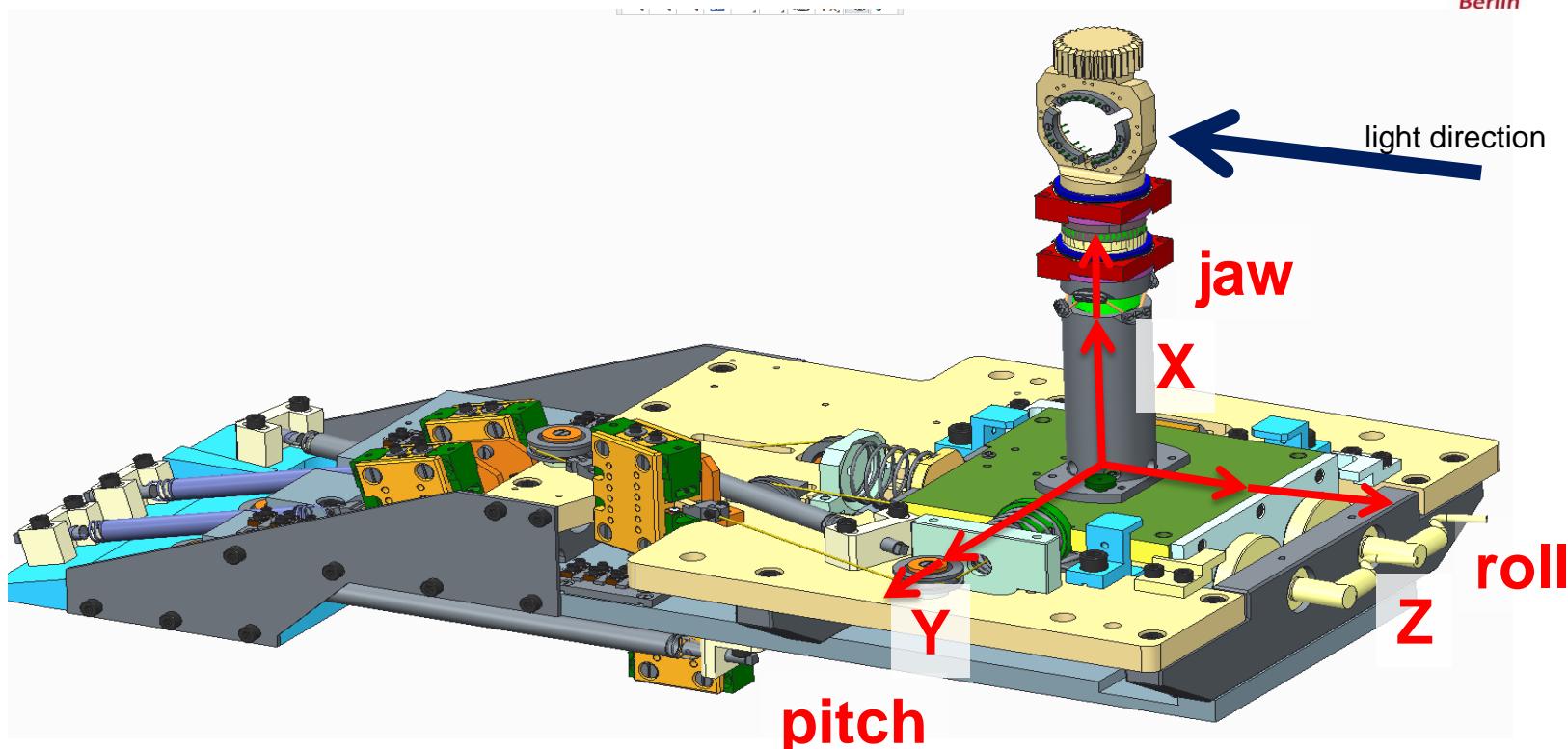
Sample manipulator



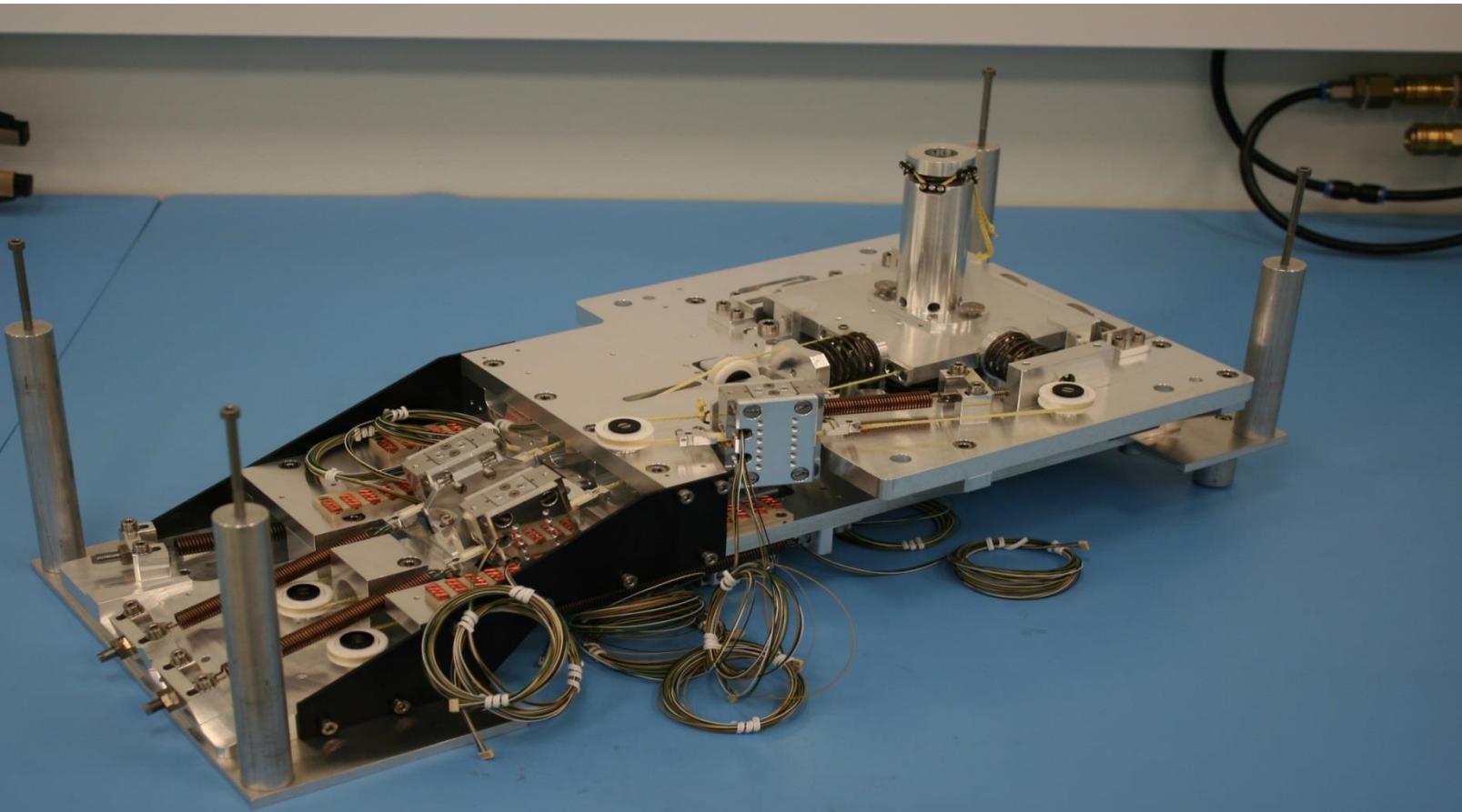
Sample manipulator

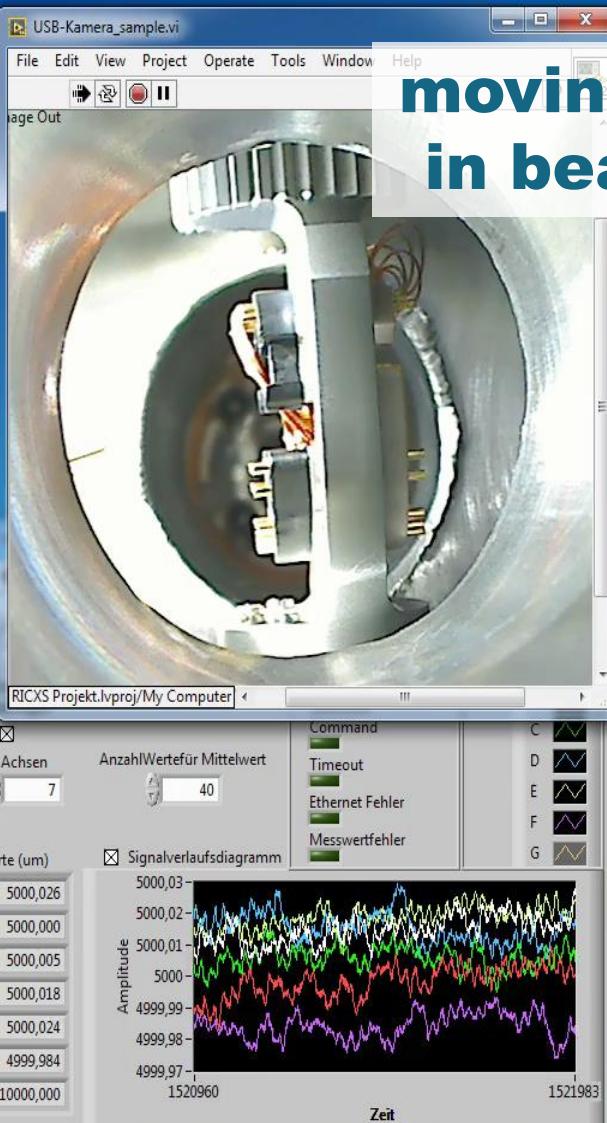


Sample manipulator



The sample manipulator



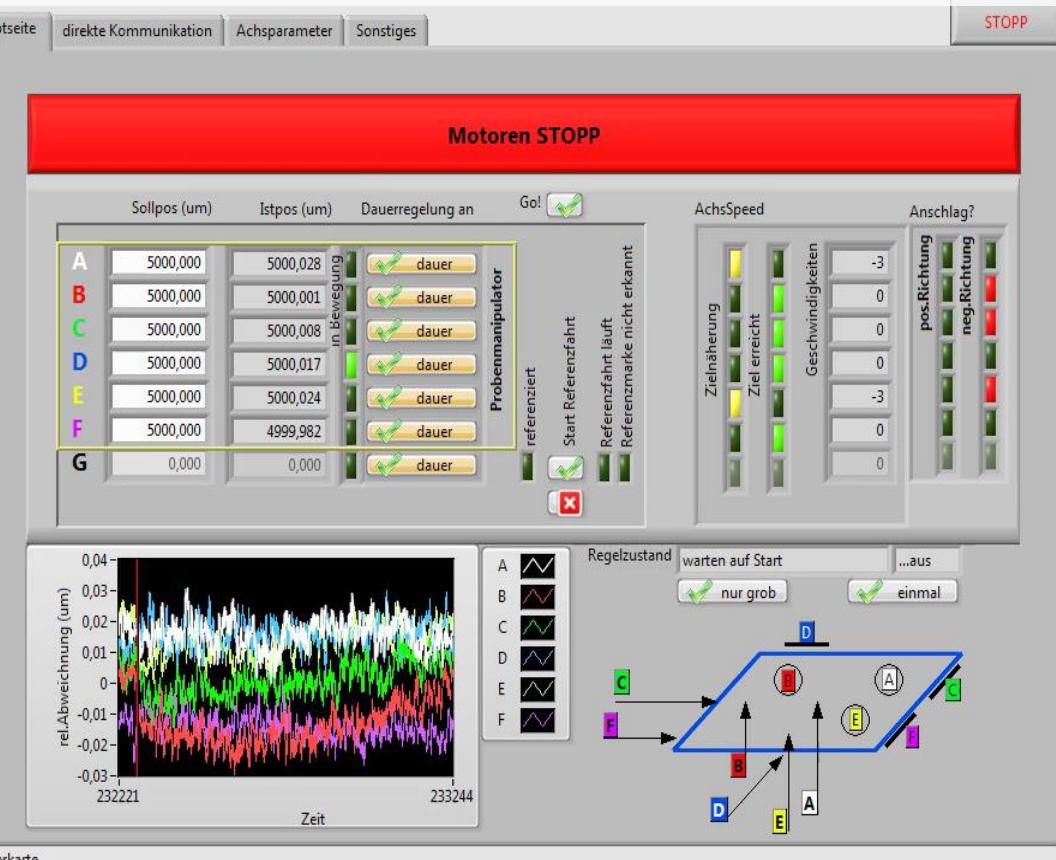


Die Übernahme der Messwerte erfolgt über den Melder: "Melder NCT6500 (analog längs)"

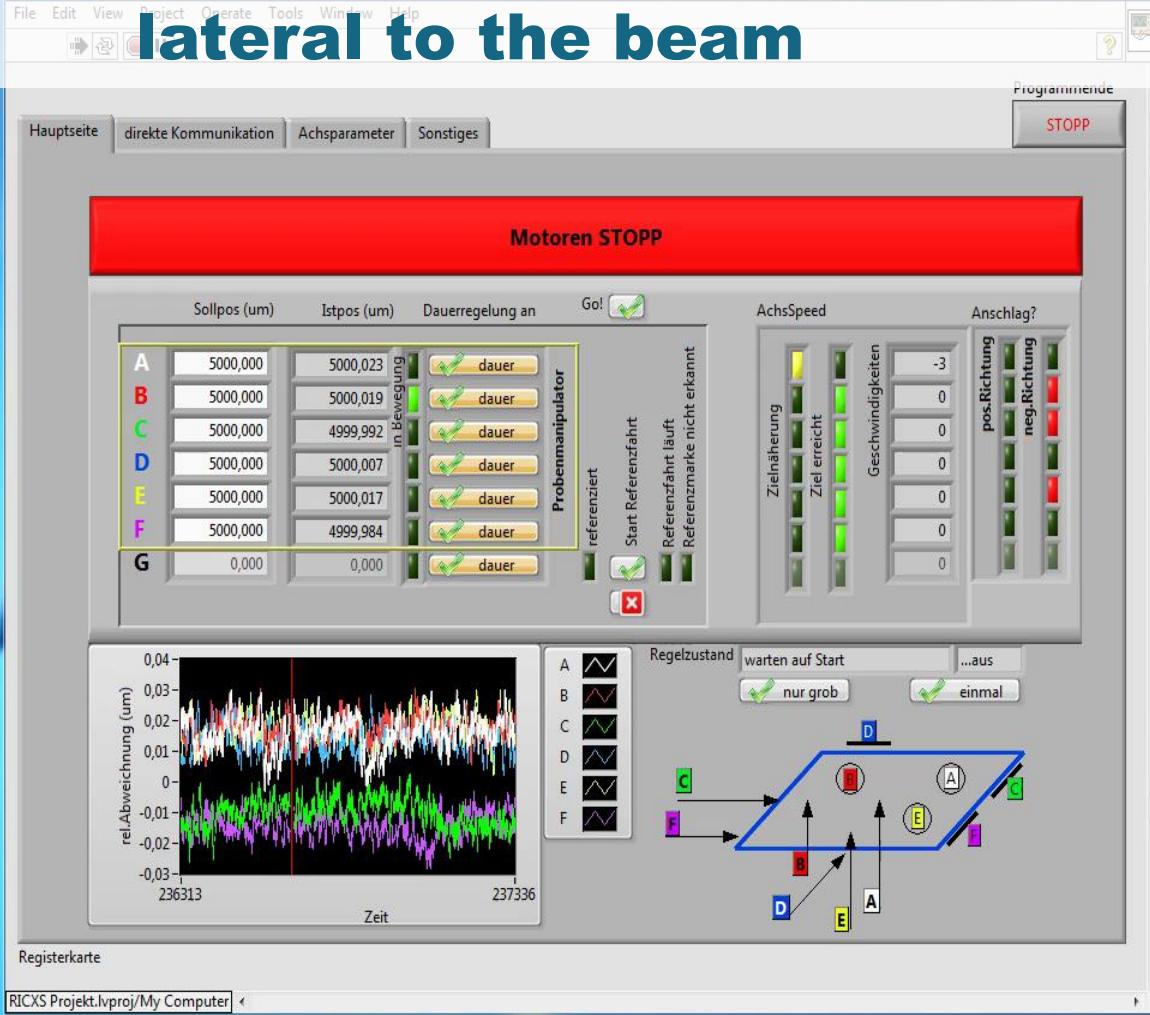
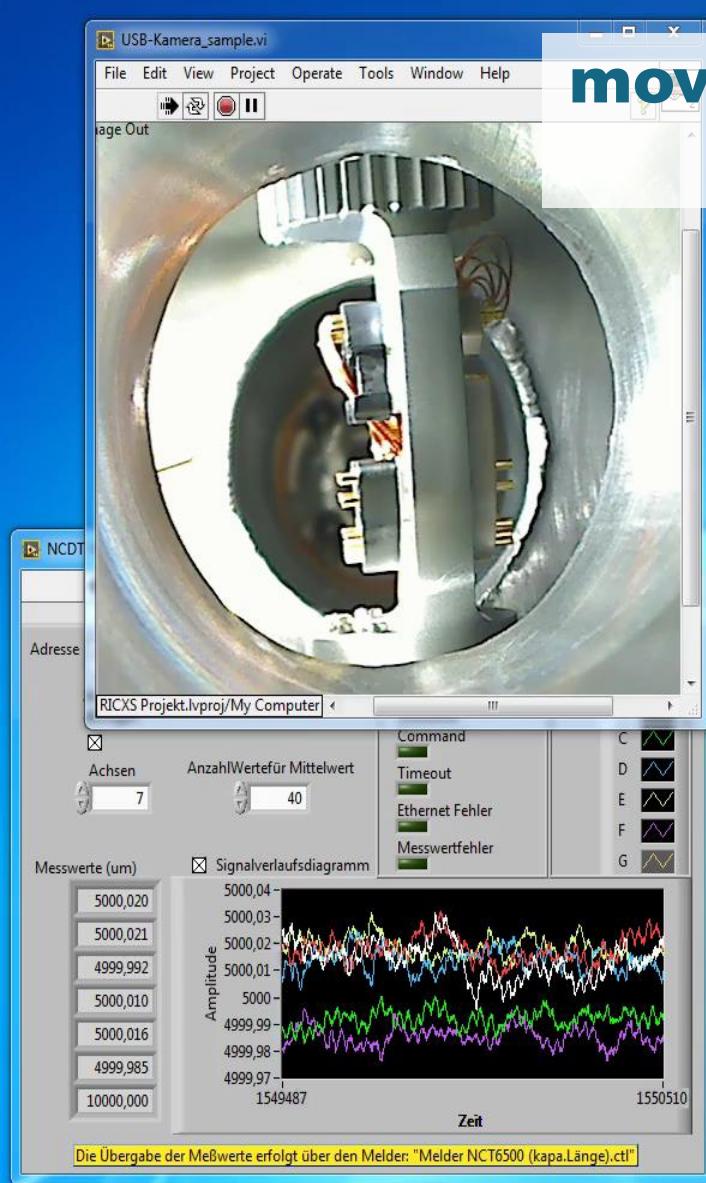
MEDSH4

Tino Noll et. al.

moving the sample platform 50 microns in beam direction and return to origin



moving the sample platform 1 micron lateral to the beam



**moving the platform 2mm
vertical up and down**

USB-Kamera_sample.vi

File Edit View Project Operate Tools Window Help

Image Out

NCDT

Adresse

RICXS Projekt.lvproj/My Computer

Achsen 7 AnzahlWertefür Mittelwert 40

Messwerte (um)

5000,013
5000,009
4999,987
5001,020
5000,016
4999,992
10000,000

Signalverlaufsdia gramm

Amplitude Zeit

Die Übergabe der Meßwerte erfolgt über den Melder: "Melder NCT6500 (kapa.Länge).cti"

Probenmanipulator.vi

File Edit View Project Operate Tools Window Help

Hauptseite direkte Kommunikation Achsparameter Sonstiges

Programmende STOPP

Motoren STOBB

Sollpos (um) Istpos (um) Dauerregelung an Go!

A 5000,000	5000,015	dauer
B 5000,000	5000,006	dauer
C 5000,000	4999,989	dauer
D 5001,000	5001,019	dauer
E 5000,000	5000,022	dauer
F 5000,000	4999,989	dauer
G 0,000	0,000	dauer

Achsspeed Anschlag?

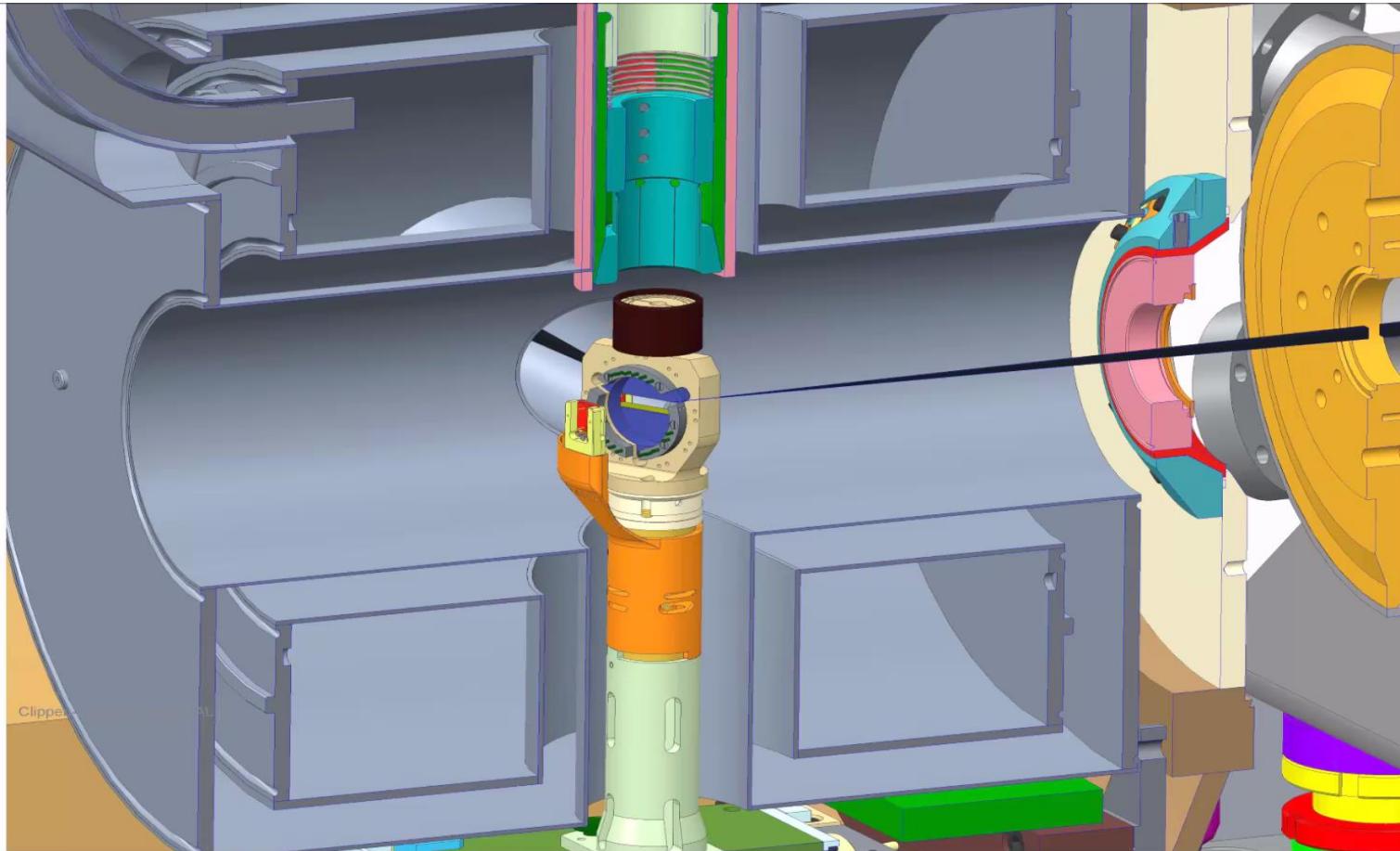
Zielnäherung Ziel erreicht Geschwindigkeiten pos.Richtung neg.Richtung

Regelzustand: warten auf Start nur grob einmal

rel. Abweichung (um) Zeit

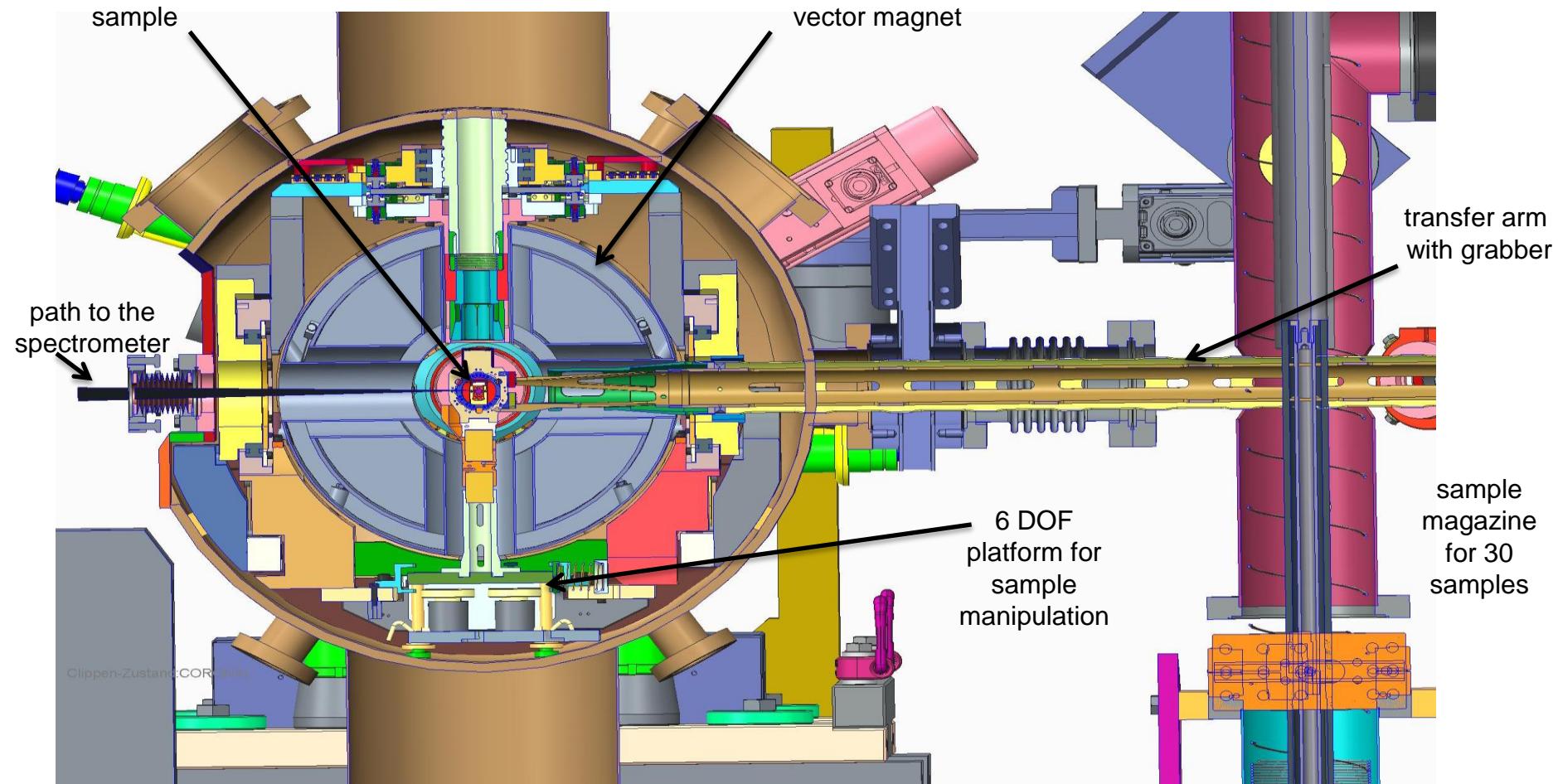
Registerkarte RICXS Projekt.lvproj/My Computer

The image shows a screenshot of the LabVIEW graphical user interface. On the left, the 'USB-Kamera_sample.vi' window displays a camera feed of a mechanical assembly with a gear and a probe, along with a waveform plot for axis A. On the right, the 'Probenmanipulator.vi' window shows a control panel for a probe manipulator. It includes a table of target and current positions for axes A through G, a graph of relative deviation over time, and a trajectory diagram showing a path with points A through F.

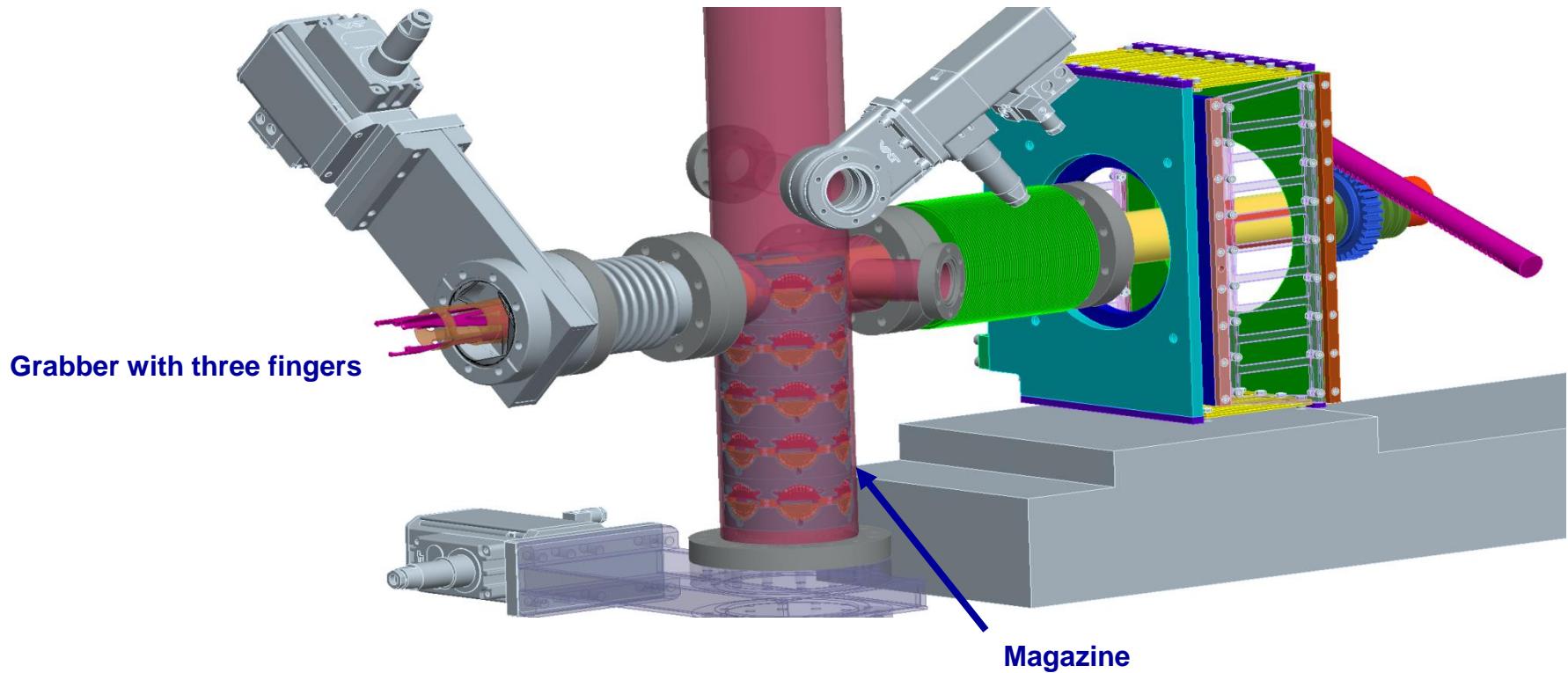


Sample transfer

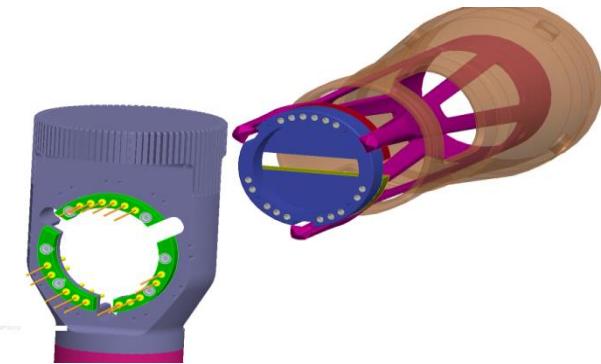
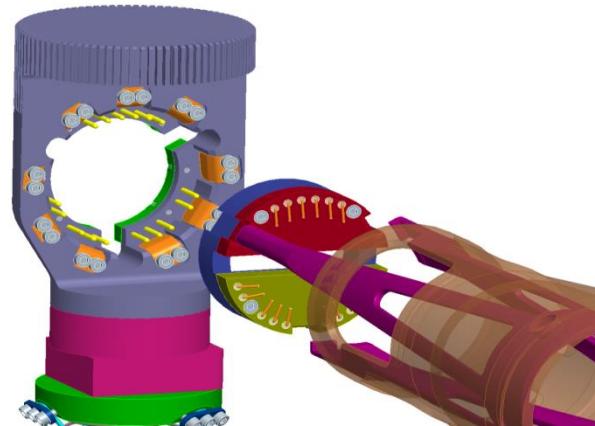
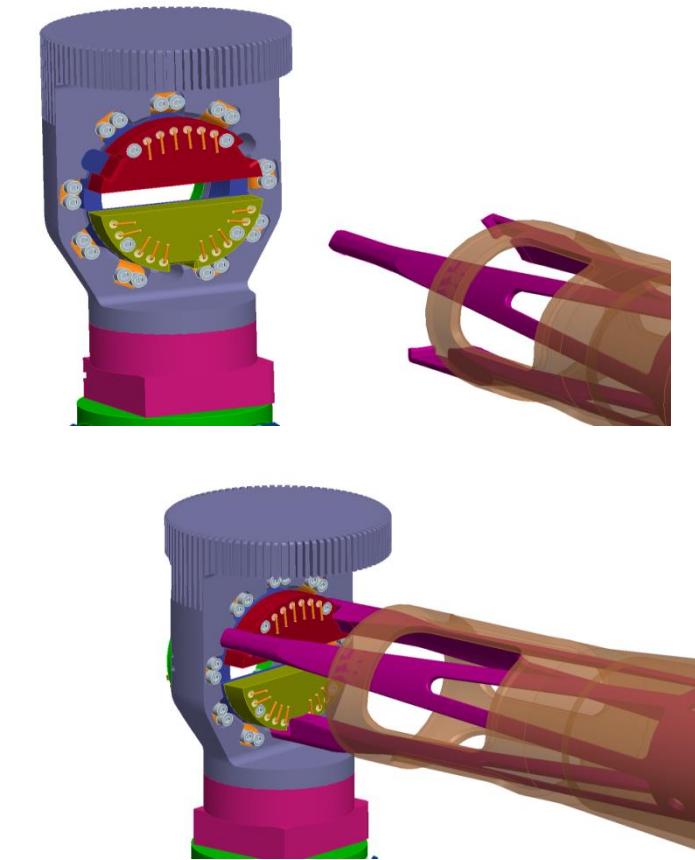
coronal section of the endstation

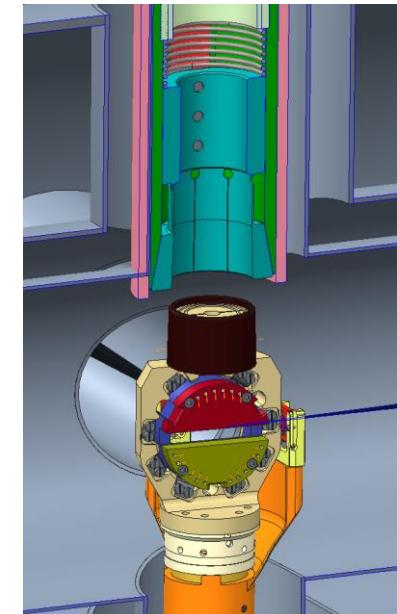
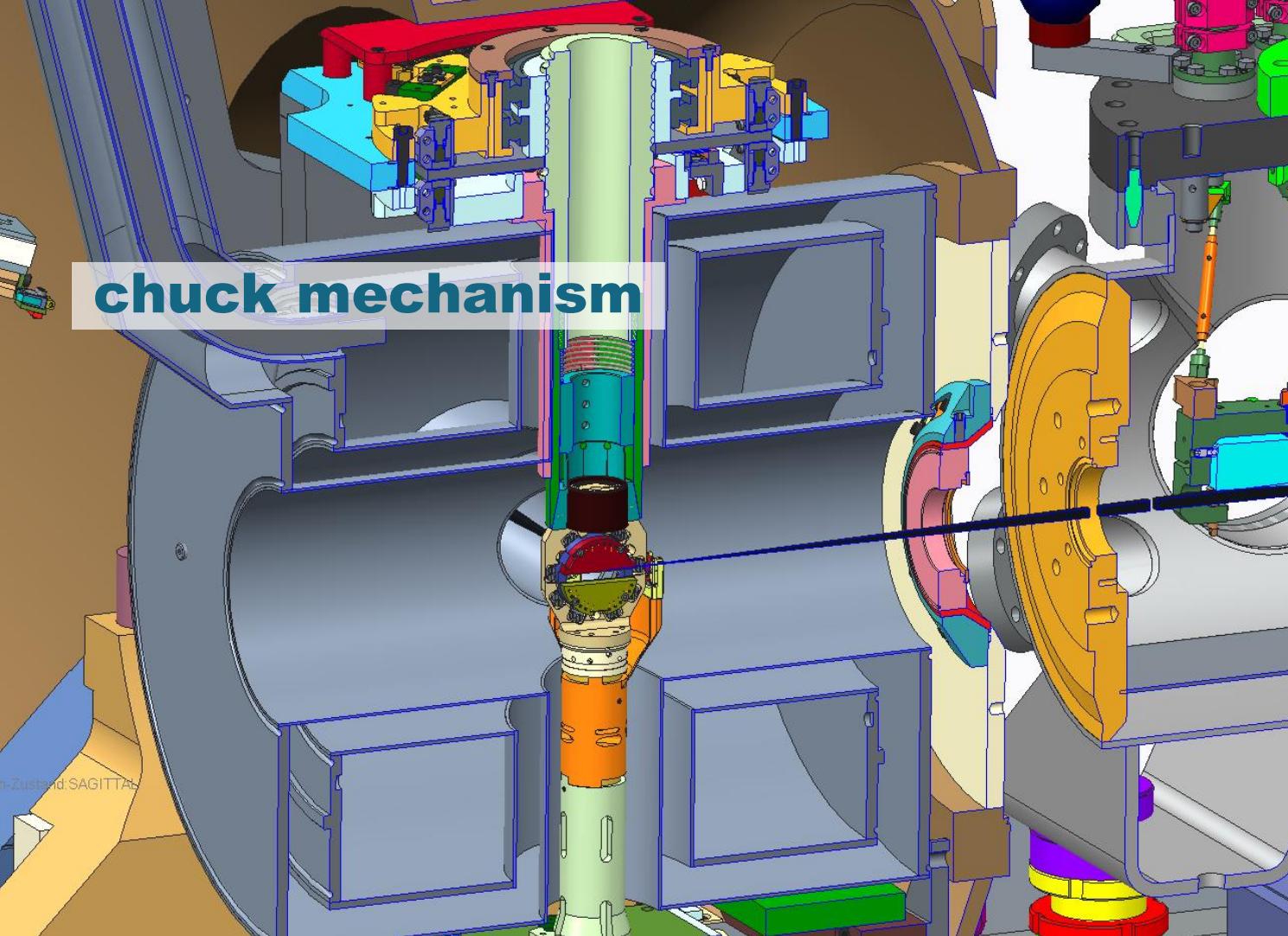


Sample transfer unit



Sample exchange inside the chamber





Thank you!